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CZECHOSLOVAKIA: FACTORS OF GEOGRAPHIC UNITY

BESSIE C. ENGLE

Czechoslovakia has noteworthy geographic unity. Centrally located in Europe, it extends 594 miles from east to west—a distance almost exactly that from Chicago to Washington, D. C.—and varies in width from 45 to 175 miles. The area (54,877 sq. mi.) is slightly less than that of Illinois (Fig. 1), but the total population and its density are about 8 per cent greater.

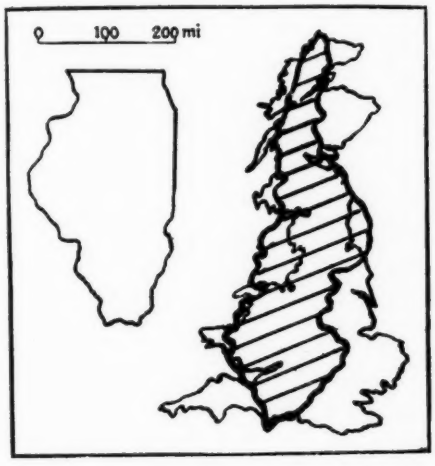

FIG. 1. Czechoslovakia, Great Britain, and Illinois on the same scale

Slav races having a common literary language predominate. In Bohemia (Fig. 2) they are known as Czechs, in Moravia as Moravians, and in Slovakia and Ruthenia as Slovaks. This racial bond, and a common oppression by the Hapsburgs for almost a thousand years, have helped weld them into one nation. The corrupt and stagnant Austro-Hungarian Empire was strong enough to encompass them, but was neither able to assimilate nor subdue them.

Formidable mountains demarcate the area except on the south (Fig. 2). These mountains, altho good boundaries, are not complete barriers. The chief passes across the barriers are the Kheb (Eger), Saxon, and Moravian Gates, carved by the Rivers Eger, Elbe, and Oder, respectively. Important railroads cross the barriers thru these passes. The Kheb Gate provides communication with western Europe. The Saxon and Moravian Gates are lower and broader than the Kheb pass, and provide easier communication with the great lowland of northern Europe. The Elbe system is navigable from southern Silesia to the Baltic Sea. The easterly

position of the Moravian Gate and the vast plain to the north and east, afford easy rail connections with Poland, Russia, and the Baltic countries. Other more difficult passes than the three mentioned are used relatively little. The southern boundary of the country is a less definite one. Foothill country passes rather abruptly along an irregular east-west zone into the broad Hungarian plain.

AGRICULTURAL ADJUSTMENTS TO CLIMATE

The predominating type of climate is the humid continental with long summers (Figs. 3 and 4). Its chief characteristics are: great

FIG. 2. Czechoslovakia, its political divisions, bordering mountains, principal rivers, and neighbor countries

annual range of temperature; a growing season of five to six months; a moderate amount of precipitation well distributed thruout the year, but with a summer maximum in most places; and with marked variability from day to day, the result of cyclonic air movements. The area having this type of climate is partially bordered by areas in which the high altitude type of climate occurs. The average annual precipitation amounts to about 20 inches on the lower levels, 40 inches in the Giant Mountains, and 70 inches in the Bohemian Forest.

Arable land comprises 45 per cent of the area. Almost 40 per cent of the population is engaged in agriculture. Climatic conditions permit important production of a great variety of crops

(Figs. 5 and 6). The existing conditions of moisture and temperature, and ability to thrive in many kinds of soil, account for the almost universal production of hay, rye, oats, barley, and potatoes. The cereals, being hardy and maturing in a short season, are important crops in both uplands and lowlands. Barley and hops are the basis of an important brewing industry. Most of the rye and wheat, and some of the barley, are fall-sown. These crops are seldom greatly damaged by alternate freezing and thawing of soil moisture, because snow covers the ground during most of the winter. Hay, grass, cereals, and root crops support an important and growing live stock industry in which cattle, swine, goats, and sheep rank in the order named.

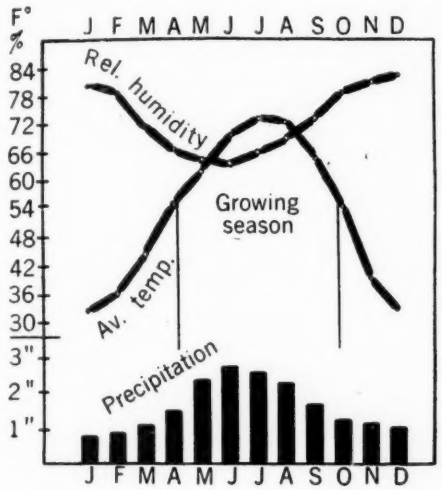

FIG. 3. Average monthly precipitation, temperature, and relative humidity in Praha (647 feet above sea-level). Average annual precipitation, 19.2 inches during 70 years. Temperature and relative humidity charted from 60 year records

Sugar beets and potatoes are the chief root crops. Root crops are especially adapted to withstand adverse cyclonic weather conditions of drouth, strong winds, and early frosts. Czechoslovakia's average annual production of sugar from 1909-10 to 1913-14 (1,017,237 short tons) was 5.5 per cent of the world's sugar (18,402,850 short tons), and 12 per cent of its beet sugar (Fig. 7). More than half the sugar is available for export—a quantity exceeding that exported from any other European country. The potato is at home in both light and heavy soils if good drainage is afforded. Potatoes and rye bread are important foods for both mountaineer and plainsman. The sugar beet is much more exacting than the potato in its physical requirements, demanding a longer growing season, and deep, fertile, and fine textured soils. Its acreage is therefore concentrated (Fig. 2) in the broad alluvial lowland of north-central Bohemia (Elbe River basin), central and southern Moravia (Moravia River basin), and in southwestern Slovakia (Vah River basin).

Many middle latitude fruits of good quality grow in abundance. Orchards are rare, the fruit trees lining the highways and providing shade. A surplus of some of the fruits is marked in northern Europe where lower temperatures and other conditions are not so favorable for their production.

NATIVE VEGETATION AND RELATED INDUSTRIES

The native vegetation in the less rainy areas consists of grasslands and scattered hardwood trees. Mixed forests and coniferous trees characterize the wetter areas. The percentage of total area in forests is 33 per cent (Fig. 8), an amount exceeded in Europe only in Finland (63 per cent), Sweden (47.6 per cent), and European Russia (37 per cent). Five high schools devoted exclusively to instruction in forestry, and special sections of forestry in the two Agricultural High Schools, indicate the value placed upon the timber resources and their conservation. Hardwood trees grow mostly on the lowlands and occupy about 10 per cent of the forested area. Coniferous forests occur in the high altitudes, and occupy about 78 per cent of the forested area. Mixed forests make up the balance. Wood of good quality, particularly maple from Slovakia and Carpathian Ruthenia, has been used since the early Middle Ages in the manufacture of musical instruments. About 25 to 30 per cent of the soft wood production is used for firewood. The remainder is used in the building trades, furniture, paper and mining industries, and for telegraph and telephone poles. Czechoslovakia has about 40 per cent of former Austria-Hungary's paper industry, and exports an equal percentage of the product. Much of the timber is produced in mountainous districts where water power is plentiful. Advantage is taken of this cheap power in operating about 70 per cent of the sawmills. Steam power turns the machinery in about 28 per cent of the sawmills, and hydro-

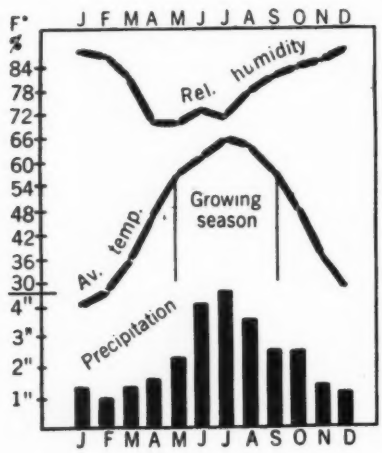

FIG. 4. Average monthly precipitation, temperature, and relative humidity in Mor-Ostrova (727 feet above sea-level). Average annual precipitation, 27 inches during 11 years. All data charted from 11 year records

electric operates the remainder. Timber and its products usually rank second to sugar among Czechoslovakia's exports.

PRINCIPAL MINERAL INDUSTRIES

Considerable significance attaches to Czechoslovakia's coal and iron resources (Fig. 9). A large reserve of bituminous coal of coking quality occurs in the Ostrave-Karvin (Ostrau-Krakow) field in the Dombrova Basin. This field produces about 10,000,000 tons annually. The lignite of Bohemia is comparable to the black lignite or sub-bituminous coal of western United States. The annual production is about 20,000,000 tons. The chief lignite district is that of Most-Falknov. Bohemia is fairly well supplied with iron ore.

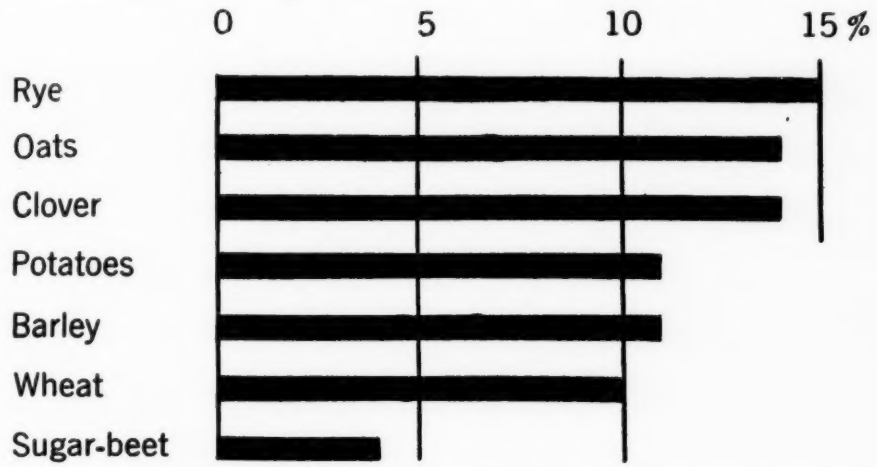

FIG. 5. Percentage distribution of the arable land (1922) among the most important crops, excluding hay. "The Czechoslovak Republic," Bank of Europe, 1923, p. 9

Slovakia's ore is of excellent quality, and the quantity is unknown. The quality of these minerals, their relative distribution, and the location of the area with reference to other sources of iron, enable Czechoslovakia to take high rank among the manufacturing countries of Europe. About 33.7 per cent of the population is engaged in industry apart from agriculture. Czechoslovakia has approximately 85 per cent of Austria's manufacturing industries. The insufficient production of iron ore results in expensive manufacture of iron and steel, and makes competition with other countries very difficult. In order to compensate for these handicaps, the industry has amalgamated its interests and specialized its products. The products consist chiefly of agricultural machinery; equipment for

sugar factories and refineries, breweries, and railroads; and motors of various kinds. There is a considerable export of agricultural machinery to eastern and southern Europe. Czechoslovakia occupies a leading position in the world's markets in respect to equipment for sugar factories and refineries, breweries, and distilleries.

Products of the glass and ceramic industries have a wide market and admirable reputation which have continued from the Middle

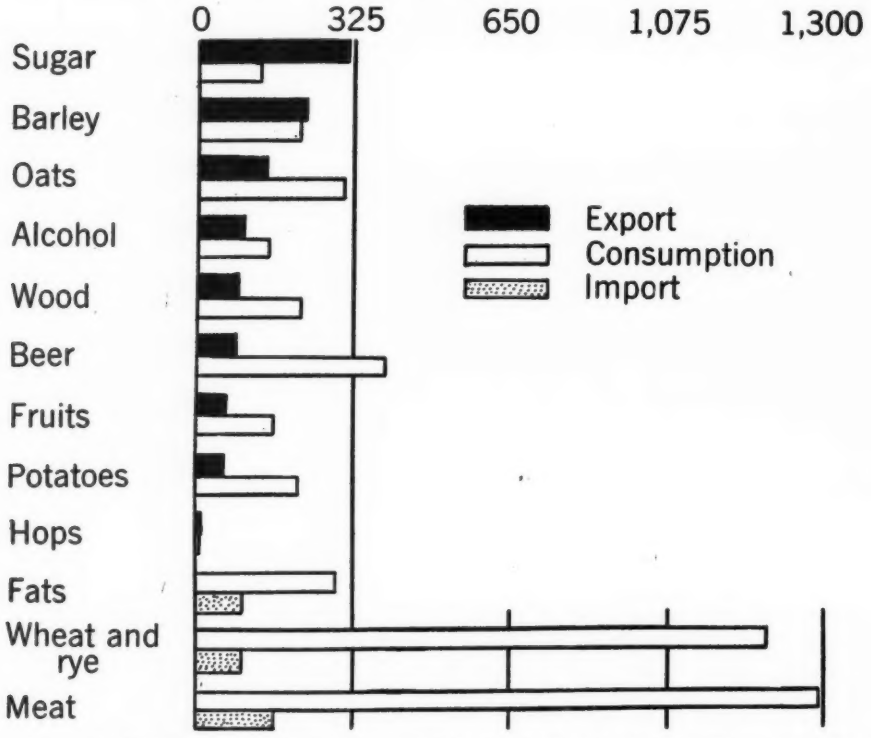

FIG. 6. Relation of agricultural production to foreign trade in millions of dollars, 1922. Dr. Vladislav Brdlik, "Agriculture," about 1923, p. 19

Ages. About 90 per cent of the glassware is exported. Austria-Hungary's enamel ware trade was second in the world. About 80 per cent of the industry is now in Czechoslovakia, and a greater portion of its product is available for export. Yablonets (Jablonec) glassware is world-famous. The glass industry is of greatest importance in Bohemia, and originally depended upon wood as fuel. Only the old works are located near the forests. Coal is used in the modern industry, and the factories are located

near coal fields and very pure sandstone. There are great reserves of glass sand, kaolin, and plastic clay, which are of very high quality. Both kaolin and clay are exported. All the essentials for ceramic manufacture, except gypsum and a few chemicals, are found in Czechoslovakia. Imports of these ingredients are being reduced with the development of hitherto unexploited mineral resources of Slovakia.

FACTORS OF GEOGRAPHIC DISUNITY

Elements of disunity are of significance to the economic, social, and political integrity of the young Republic.

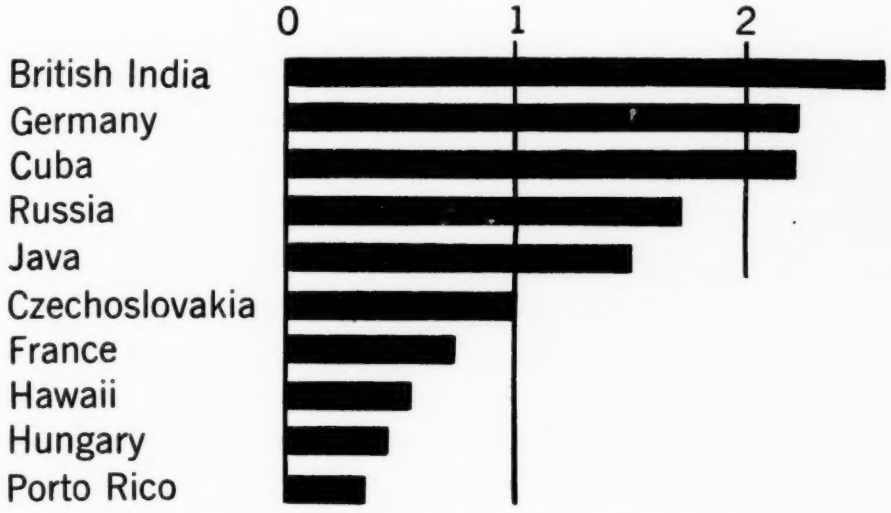

FIG. 7. Average annual production of sugar in millions of short tons, from 1909-10 to 1913-14 in the ten leading countries

There are marked differences in stage of development. Bohemia Moravia, and Silesia have a high arable land ratio, and surface conditions make communication relatively easy. Bohemia and Moravia are inhabited by one of the best educated peoples in Europe. The Bohemians and Moravians are the industrial, social, and political leaders of Czechoslovakia. Their work since the formation of the Republic is highly commendatory. The former greater political oppression of the Slovaks and a less favorable natural environment, have been important factors in producing differences between the eastern and western parts of the country. Much of the surface of Slovakia and Ruthenia is maturely dis-

sected. Consequently it is traversed with considerable difficulty. Only a small fraction of the land is arable, population is relatively sparse, and the area is politically inarticulate. In Slovakia 27.8 per cent of the population was illiterate in 1910, while in Bohemia, Moravia, and Silesia, only 2.1 per cent was so classed. Pastoral pursuits, semi-nomadism, poorly developed subsistence agriculture, and lumbering in Slovakia an Ruthenia, are in sharp contrast with the highly developed agricultural, manufactural, and commercial activities of Bohemia and Moravia.

Surface conditions within Czechoslovakia vary considerably and make difficult the maintenance of political unity. Bohemia is

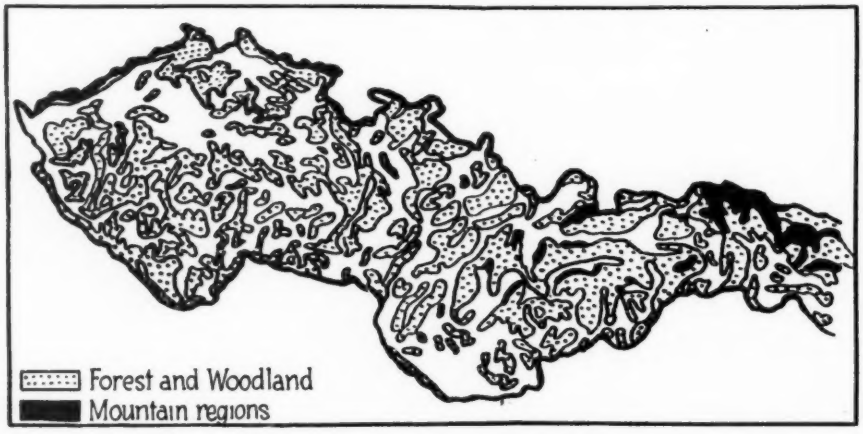

FIG. 8. Forests in Czechoslovakia. J. G. Bartholomew, "The Advanced Atlas of Physical and Political Geography," 1917, p. 54

a basin-plain surrounded by mountains, and with its natural outlet to the north thru the Elbe valley (Saxon Gate). Much of Moravia, Slovakia, and Ruthenia is drained by the Danube system, and broken by ridges which have a general north-south trend. Physically, Moravia, Slovakia, and Ruthenia face south. Politically, they now face west.

Added to these natural hindrances to cohesion, is the long, narrow form of the area, which is constricted in its middle portion, and has the seat of government in the far western end at Praha (Prague).

Racial differences also exist. The Czechs of Bohemia are almost surrounded by Germans who have moved over the border. The population of Moravia is almost half German. The Germans

and Moravians have been antagonistic for the past 600 to 700 years. The Germans are better educated and stronger industrially. The Slovaks and Ruthenians are partially separated by groups of German villages, which isolate many Slovaks from the main body in Slovakia. The Magyars, steppe peoples in the Hungarian plain, have been hated aggressors and oppressors of the Slovaks and Ruthenians for about a thousand years.

MAINTENANCE OF POLITICAL SECURITY

The political unity of Czechoslovakia depends largely upon the character of governmental policies and the tact with which they

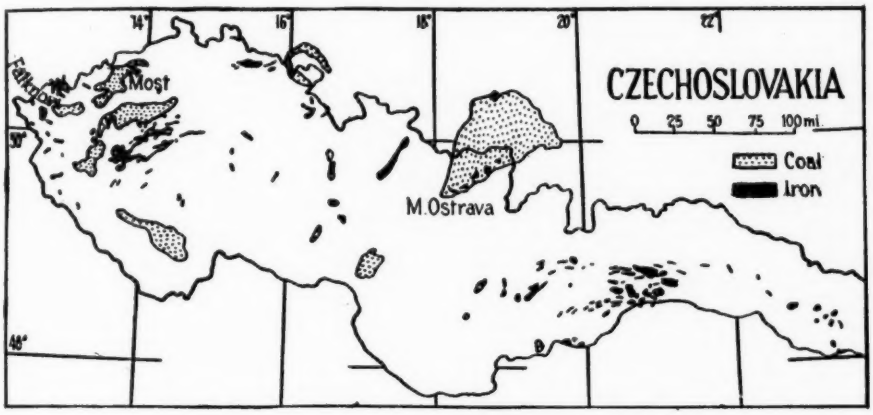

FIG. 9. Coal and Iron Resources of Czechoslovakia

are enforced. The organization of more than 3,000 schools in Slovakia and many in other backward areas within four years after the founding of the Republic, promises greater educational equality and understanding. Railway connections between the eastern and western sections are being greatly improved. The government is cooperating with industrial groups. Land tenancy is being reduced by land reform laws, which are slowly breaking up the large estates. These date from feudal times and comprised the most productive agricultural areas (Fig. 10). The notably high exchange value of the Czechoslovak crown among European currencies since the War, is indicative of a sound economic policy.

Czechoslovakia is a land-locked state with neighbors who at some time have been hostile (Fig. 2). These dangers are reflected in negotiations which have secured port concessions in Hamburg,

Stettin, Magdeburg, Trieste, and Galatz. More than fifteen commercial treaties based upon reciprocal and liberal tariff systems have been made. There are many organizations dealing with problems of commerce.

Czechoslovakia occupies a position of economic stabilizer in the heart of Europe. The country is almost self-supporting in plant and animal foods, entirely so in raw materials for the manufacture

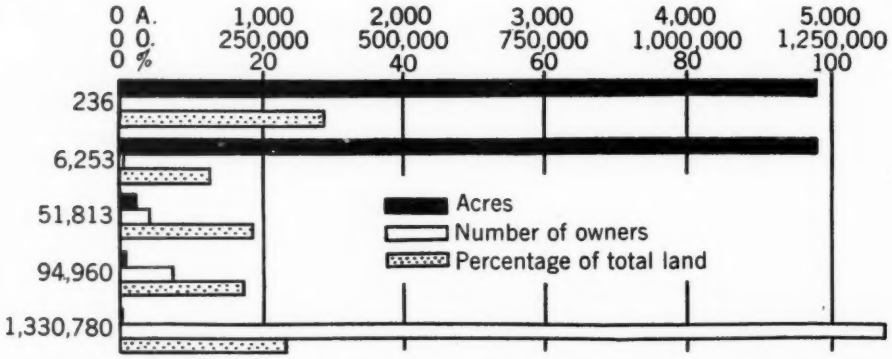

FIG. 10. Landed property in Bohemia, Moravia, and Silesia before the War

of sugar, alcohol, beer, malt, starch, porcelain, and timber; has varied and abundant mineral resources as yet incompletely exploited in Slovakia and Ruthenia; and has an important export of raw materials and manufactured goods. Whether the diversity of natural environment and human relations can be successfully and permanently unified, is a problem which will be solved by natural, economic law. Policies of the administration since the establishment of the Republic have already achieved a high degree of unity.

THE PRESENT STATUS OF NAVIGATION ON THE LOWER MISSISSIPPI RIVER

C. A. McCOMBS
State Normal School, Normal, Tenn.

There is no more fascinating chapter in American industrial history than that which deals with the thriving days when the Mississippi was alive with commerce and the towering, ornate, paddlewheel steamboats were in their prime.[1] The old days of the "bustling life" of which Mark Twain wrote have gone forever. The river queens of the type of the *Prairie Belle,* of which John Hay sang, have, long ago, either been broken up for kind-

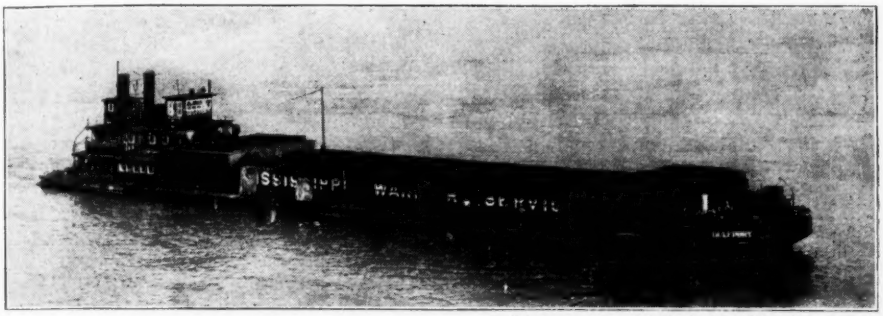

Photo courtesy Mississippi-Warrior Service

FIG. 1. The self-propelled barge *Gulfport,* one of three packet boats in operation between Saint Louis and New Orleans, with intermediate stops at Cairo, Memphis and Vicksburg. These boats carry from 1,000 to 1,400 tons of highclass merchandise in either direction. The boats leave New Orleans every Saturday evening arriving at Saint Louis the second Tuesday evening. In the reverse direction they leave Saint Louis Friday evening and arrive in New Orleans the following Wednesday evening

ling wood or, in a few cases, preserved at the docks of the big river cities, curious relics of an outgrown age; while the bones of most of the group of intrepid, profane, and picturesque skippers who drove these stately stern wheelers in many nerve wearing races are buried by the river they knew, cursed, and loved so well.[2]

Let us note the present status of this old time freighter at the more important river towns on the Lower Mississippi. "Here we see the fragmentary remnants of such a transportation system as the world will probably never see again."[3] The reminiscent

[1] Willis Gibson, *Scribner's Magazine,* Jan., 1903, p. 6
[2] Ibid., p. 8
[3] The *Outlook,* July, 1915, p. 642

veterans about the wharf boats at Saint Louis will tell you that where one now sees a dozen of the stately old vessels there were no less than a hundred in the 50's and 60's.[4] Natchez, Mississippi at whose wharves dozens of steamboats of this old type once docked reports the arrival and departure of a single fishing boat of the old type on occasional fishing trips.[5]

The few that are left are but survivals of a long process of elimination. The *Eagles* for example, as the boats operated by the Eagle Packet Company were called, once numerous have been reduced to two. In 1910 this company owned and operated six boats from Saint Louis as its principal terminal. Three of these boats were lost in the ice at the mouth of the Tennessee River during the severe winter of 1918. The fourth ran upon a snag near Chester, Illinois and went down with a cargo of leather early in 1919.

Other survivals of the ruinous railroad competition of the later part of the nineteenth century are the boats of the Tennessee River Packet Company. This company now possesses and operates five boats out of Saint Louis. Its work is devoted almost exclusively to the carrying of excursion passengers and local freight. Three of these boats ply the waters of the Mississippi, the Ohio, and the Tennessee rivers from Saint Louis via Cairo to points on the Tennessee; one sails between Saint Louis and Cairo, while the fifth boat makes trips up the Mississippi from Saint Louis to Quincy and serves all intermediate landings.[6]

There are no thru steamers of the old type from Saint Louis to Memphis, Vicksburg, or New Orleans. However, there are several boats making daily trips, serving the landings both north and south of Memphis. A search of the landings of the river towns would show that there are not now in service more than a score or two of stately old stern wheel vessels, the last representatives of the thousands of vessels that plowed the waters of the Mississippi during the last century.

Truck Delivery Service

The vessels that operate north and south out of Memphis represent 'new wine in old cups' in the steamboat service. The old

[4] The *Outlook*, p. 642

[5] Natchez Chamber of Commerce Letter, September 2, 1922

[6] St. Louis and Tennessee River Packet Company Pamphlet, 1922

type of steamer representing the old cups, the new truck delivery service the new wine. Both the Lee Line and the Kate Adams Line instituted truck delivery service from the river landings to the interior points early in 1922.[7] The good roads that have been built from the steamboat landings leading back from the river towns, enables these lines to make store door deliveries as far as twenty miles on shipment via these boats.

There are a number of smaller individual crafts operating both north and south from Memphis as a base that have schedules that make it both profitable and convenient for serving the terri-

Photo courtesy Mississippi-Warrior Service

FIG. 2. The towboat *Natchez* and tow in the harbor at Memphis—enroute from New Orleans to Saint Louis. There are six of these towboats in service and they handle 6,000 to 8,000 tons in a tow upstream and as high as 15,000 tons downstream. A tow leaves New Orleans and Saint Louis every sixth day. The five large barges shown in the tow are the standard type of which the Mississippi-Warrior Service has forty in constant operation. They are all-steel and have a capacity of 2,000 tons each

tory along the river most satisfactorily by the aid of truck delivery service mentioned above. The new feature of truck delivery service promises to be one of the most powerful factors in the reviving of river commerce from the fact that the cost of transshipment from rail to river and from river to rail was often many times more than the cost of the transportation, and once such a great obstacle in water transportation, apparently can be much reduced, and railroad competition can be mitigated.

[7] Memphis Chamber of Commerce Journal, Feb., 1922, p. 15

Railroads Incapable of Handling All the Traffic

The railroads of the Mississippi Basin have been growing more incapable of handling the traffic. Mr. James J. Hill, one of the best known railroad men of the country, pointed out in 1906, that in the ten years between 1895 and 1905, the railroad mileage had increased but 21 per cent while the passenger business had grown 95 per cent; and the freight business 118 per cent. In 1908 he stated that the mileage between 1897 and 1907 had crept up to 24.7 per cent; but in the same time the increase of passenger business had leaped to 126 per cent; and that of freight traffic to 148.7 per cent.[8]

Congestion of railroad traffic during the World War and the period immediately following it is too recent for us to forget the inadequate service of the railroads during that period.

Can the Mississippi River once more become an important highway of commerce and aid in removing the burden from the railroads? Experienced river men who have been watching the signs of restoration on the river believe it is reviving.[9] Traffic has revived on the Mississippi, wrote Clark McAdams in the *Manufactures Record* in April, 1922, and the great waterway is beginning to prove its value not only to the cities on its banks but to points far inland.[10]

They say the apparent renaissance of river traffic began on the lower Mississippi when a self propelled barge—a modified type of the steel barge used on the Great Lakes—made its initial voyage down the Mississippi from St. Louis to New Orleans early in April, 1916.[11]

The United States Government Enters the Field

In January, 1918 while the railroads of the Mississippi Basin were groaning under the immense volume of war time traffic and were daily growing less able to handle it, the Director General of Railroads appointed a committee to study the possibilities of utilizing the inland canals and coastwise waterways for transportation purposes, and as a means of alleviating the overburdened

[8] Bogart and Thompson, Readings in Economic History of the United States, p. 677
[9] *Scientific American*, May 20, 1916, p. 114
[10] A Barge Line that is Making Money, *Current Opinion*, April, 922
[11] *Scientific American*, May 20, 1916, p. 114

railroads.[12] After investigating the possibilities of inland waterways, this committee submitted a report to the Director General recommending the utilization of the New York Barge Canal, and the construction of a fleet of barges for the Lower Mississippi costing not less than $8,200,000.

In pursuance of this recommendation, the committee chartered 20 steel flat deck barges belonging to the United States Army Engineers, erected temporary cargo houses on them capable of carrying 450 tons of freight each. It purchased part of the fleet of the Kansas City-Missouri River Transportation Line consisting of two 1000-ton barges, three 600-ton barges and two small towboats.[13] It leased a small boat from a private owner. With this small fleet of 26 vessels, operations were begun between Saint Louis and New Orleans on September 28, 1918 under the name of the Federal Barge Line.

During the first year of operation on the Mississippi, with this small temporary fleet, the Federal Barge Line performed 750,000,000 ton-miles of service. Of course if we consider air line miles of transportation service, we must reduce the above number by nearly 50 per cent since the river is increased by meandering nearly twice its air line length between Saint Louis and New Orleans.

In 1921 it was estimated that the number of ton-miles of transportation service supplied by the Federal Barge Line had increased to 1,000,000,000.[14]

The average loading of a freight car today is about 40 tons to the car. Thus about 25,000,000 car-miles of service were added by the Federal Barge Line to our transportation and when we consider air line miles there are still 12,500,000 car-miles supplied thru this system of transportation. Certainly this barge line will aid considerably in removing the congestion from the overburdened railroads. It is reported that 655,780 tons of freight were handled on the Mississippi for the current fiscal year ending June 1922, on which there was a saving of $850,000 to the shipping public. It is reported that a greater tonnage of freight was handled with a greater saving to the shipping public for the fiscal year ending June 1923. The fleet of barges at present number

[12] Mississippi Warrior Service Bulletin, 1921, pp. 3 and 4

[13] Ibid., p. 3

[14] Ibid., p. 5

more than fifty. Some are of the self-propelled type and some are of the "tow-boat driven" type.

There were, till November 1923, six tow-boats in operation between Saint Louis and New Orleans bearing the names of the cities along the river as follows: St. Louis, Cairo, Memphis, Vicksburg, Natchez, and New Orleans.[15] A few months ago three new tow-boats of the latest type were added to the fleet of tow-boats. These boats vary in size but the typical ones may be described as being about 200 feet long, 40 feet wide, with a comparatively low deck and a flat hull. They are propelled by twin screws driven by engines aggregating 1800 horse power to each boat. These vessels can push 15,000 tons of freight down stream in the modern steel barge, and 7,000 tons upstream. "The barge," when used in a fleet pushed by a tow-boat, furnishes the cheapest unit of transportation."[16]

Joint Rates with Railroads

On January 21, 1919, the Barge Line entered into a system of joint rates with the railroads that run parallel with the river, and, as a result, it has had capacity business since. Considerable extension of territory has been authorized and a larger section is being benefitted by reduced rates. During 1922 and 1923 the territory under the influence of joint rates was extended. The joint rates apply to Saint Louis and all points along the river on products of Arkansas and Mississippi, in fact the entire south adjacent to the river.[17]

Truck delivery service mentioned in connection with the Lee and Kate Adams lines is also used in this service. The system of joint rates will release, to a great extent, the strangle hold of the railroads on river traffic and will enable the one to supplement the other rather than enter into competition with one another as was the practice of the railroads and the old type of steamboat.

To strengthen further the relation between the railroads and the Barge Line, a scheme of "detour service" between the two systems was instituted early in 1923. The general impression prevails that inland transportation is seasonal and can not be depended upon thruout the year. But the Federal Barge Line offers the public a dependable year round service between Saint

[15] Ibid., p. 35

[16] H. G. Moulton, Railways vs. Waterways, p. 75

[17] Mississippi Warrior Service Bulletin, 1922, p. 13

Louis and New Orleans. When ice and drought cause the service to be interrupted between Cairo and Saint Louis, the traffic is diverted from East Saint Louis to Cairo thru the operation of detour arrangements in effect between the Barge Line and the railroads parallel to the river. There are no serious interruptions to navigation thruout the year south of Cairo. This system extends the period of navigation about four months per year.[18]

The tows are now directed by wireless. Every tow-boat is required to report by radio to the central wireless station at Memphis its exact location every three hours. The progress of all the boats are by this means traced upon a chart. The tows are now being run on regular schedules as dependable as the average railway schedule, states a manager of the Federal Barge Line.[19]

THE BARGE LINE AS A TRANSPORTING AGENCY

What effect has the inauguration of this method of water transportation had upon the shippers? During the first year of its operation, with its inadequate equipment, the Barge Line lost money, but in the same time, the railroads of the country had a deficit of $600,000,000. The venture, tho there was a deficit at the end of the first year, proved a financial success, because its deficit was comparatively much smaller than any of the larger industrial and transportation companies of the country, during this period.

In the five months beginning with May, 1921, it earned $257,000 more than its operating expenses. Tow-boats are now "pulling" five barges each, with a capacity of 2,000 tons to the barge from Saint Louis to New Orleans in eight days, making a return trip in sixteen days. The traffic upstream is equal to the traffic downstream. While the Barge Line was earning $257,000 it saved the shippers approximately 20 per cent on the cost of shipping every ton of freight.[20]

According to a writer in *Current Opinion* wheat was worth three cents a bushel more to the farmers of the wheat belt for the first four months of 1922 than it would have been except for the operation of the Federal Barge Line between Saint Louis and New Orleans.[21]

[18] Mississippi Warrior Service Bulletin, 1923, p. 1
[19] Mississippi Warrior Service Bulletin, Nov., 1923, p. 1
[20] A Barge Line that is Making Money, *Current Opinion*, April, 1922
[21] Ibid., April, 1922

NEW TERMINALS

As a result of this revival of traffic New Orleans, Saint Louis, Memphis and other cities on the Mississippi have been stimulated to improve terminal facilities, equip them with more modern machinery for convenience in loading and unloading of freight. Many of the terminals have been completed and are operating at capacity business.

The district at New Orleans has been a leader in this respect. The improvement of the river front, the construction of terminals and other improvements are under the jurisdiction of a Dock Board, an agency of the state. This Board has spent approximately $4,450,000 in building a modern system of docks, sheds and wharves; and has recently completed a mammoth cotton warehouse of one hundred acres of storage room, and a capacity of two million bales of cotton annually. This warehouse contains every modern device to lower the cost of handling cotton. There are other warehouses of similar magnitude at this point all of which have been constructed by the Dock Board out of funds of the state of Louisiana. Authority has been granted this district to issue $6,500,000 in bonds for increasing these facilities.[22]

The main terminal at Saint Louis is the North Market Street Terminal. The river at this point has a maximum rise and fall of forty-two feet during the year. A substantial dock is now completed for a front of 900 feet which allows freight to be raised or lowered between dock and barge at all stages of the river. It has two powerful cranes for use in the loading and the unloading of freight.

At Memphis the terminal facilities consist of wharfboats, inclines and a large storehouse and ample track connections. Here freight will be received from and delivered to Memphis shippers and consignees, and interchanged with all converging railroads. The Barge Line in the Fall of 1921 forwarded from 3000 to 5000 bales of cotton per week from this terminal for export thru New Orleans. More than $250,000 was expended on this terminal in 1921 and 1922. Nearly a million dollars more were set aside to enlarge the terminal when the volume of traffic justifies it. They are now utilizing this fund in installing a floating steel dock of the latest type.[23]

[22] The Industrial Canal of New Orleans, p. 70

[23] *Memphis News Scimitar*, Dec. 16, 1923

With the flat steel hull barges now in use, with the low insurance rates which accompany these boats, with the joint rate agreement with the railroads that parallel the river, with the detour service effected between railroad and the river, with the well planned schedule of the boats, and with adequate terminal facilities the shipping public no longer thinks of river traffic in the terms of the past of two or three decades ago when the shipments were handled, package at a time, by the old time roustabout, up and down the open levees, exposed to rainy weather, and subject to rough and careless handling. No longer does it think in the terms of dissatisfied customers, the great losses, and the almost endless list of damage claims.

CONCLUSION

The outlook for the revival of water traffic on the lower Mississippi is brighter than it has been at any period since 1865, not on account of completing the Panama Canal, not on account of the development of South American trade, not because of the increased volume of domestic traffic; but on account of the joint rate agreement with its strongest competitor, the railroad. When an adequate system of joint rates is established, an adequate system of terminal facilities at every river city is in operation, and the public reeducated to the advantage of river transportation, then we may look for a permanent use of the Mississippi as a commercial highway far greater than that of the last half century; but with the highly efficient transportation system of the Great Lakes, with the well organized system of railways, and with an ever increasing industrial population in the North Central States now consuming at home, the greater part of the agricultural products once shipped by river to New Orleans, Mississippi traffic will probably never occupy a place as relatively important as it held in 1850.

CONCERNING LATITUDE AND LONGITUDE

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"Latitude is an imaginary line running thru the poles, measured a certain number of degrees from the prime meridian."

"Longitude runs thru England. It is measured north and south of the equator. It is ten degrees apart at the poles. Its size varies with the size of the earth."

These bona fide answers to examination questions are, no doubt, extreme cases but they are indicative of how hazy most people's ideas are in regard to latitude and longitude. The ordinary person knows that latitude is measured either east or west or north or south of some imaginary line but he is guiltless of harboring any more definite information. Furthermore, very few persons have any reasoned convictions as to the desirability of such knowledge. How often does one need to know what latitude or longitude means? A meteor is sighted 30° 45′ N., 62° 40′ W. As the newspaper obligingly states that a sailor saw it, we know that the hieroglyphics mean that a meteor was seen somewhere on the ocean.

Not so long ago the clocks were set by the meridians but now the convenience of the railroads has more weight in determining time than mere meridians. To more completely muddle Father Time, daylight saving has been introduced so that neither he nor anyone else can explain why it is eight o'clock in New York City in June when it is seven o'clock in Detroit and eight o'clock in both cities at the same time in October.

It is an American habit to blame the schools and the teachers for all shortcomings. Consequently in ascertaining the views of educators in regard to the desirability of teaching latitude and longitude an explanation may be found for the general lack of information about these subjects. If we were discussing European education, our problem would be easy, for no teacher there of rank thinks a person is well educated without thoro training in these subjects. In America, the educators are not so sure. In fact, the evidence seems to indicate that there is the same general haziness in regard to the desirability of teaching latitude and longitude as there is about our knowledge of them.

The treatment of these subjects in modern textbooks is the basis of this conclusion. In one of the better elementary books, these subjects are introduced in a section on "The Earth as a Whole" which is supposed to be a part of fourth-grade geography. The note at the beginning of the chapter indicates that the work may be "deferred until some time prescribed in the local course." The understanding of the remainder of the text does not depend at all upon a knowledge of this chapter for latitude is mentioned just once in the succeeding two hundred pages and then the paragraph using the word explains the meaning: "The Hawaiian Islands are in about the same latitude—that is, at the same distance north of the equator—as Porto Rico, and their climate and products are similar." In the advanced book of this series, latitude and longitude are treated in a final chapter devoted to mathematical geography—a chapter probably studied in junior high school or else used as a reference if needed.

Does not this method of treatment seem to indicate an uncertainty in the minds of the authors as to what grade is best suited for teaching latitude and longitude? The fourth, the "grade designated by the local course" and the junior high school are all suggested. Does it not also imply that these subjects are not at all necessary for the comprehension of the geography of the elementary grades?

In another of the excellent elementary texts, latitude and longitude are given again as a part of the fourth-grade work. Longitude is mentioned once and meridians and parallels each once in the three hundred fifty pages of reading matter subsequent to this chapter. At the end of the various chapters, the author does, however, ask some six or seven questions involving longitude and a dozen involving latitude. In the second book, these subjects are relegated to the Appendix, Part I, a part of the book designed as a reference merely. Does this treatment indicate that this author is fully persuaded that some knowledge of latitude and longitude is necessary for children of the elementry grades? If so, why does he not devote more space in the regular subject matter of the text to them?

Superintendents are responsible to a large extent for our courses of study. What is their opinion of the matter? In discussing this question with several of them, the writer found them

uncertain, too. A progressive one said "I would like to have "A's" text in geography for my schools but he expects fourth-grade children to learn latitude and longitude. Doesn't he know that the children of that grade are not interested in such subjects?" The query was passed on to the author of that text and his reply in effect was, "What can an author do? Many superintendents demand latitude for the elementary text and so it must go into a book that is made to sell." Thus the story goes!

Because modern education takes into consideration more and more the activities and needs of the children themselves, an attempt was made to find out what the children think about the matter. To do this the subject was taught to two fourth-grade classes composed of children of nearly equal mentality and with similar training. The two elementary texts previously discussed were used. The teacher studied the manuals carefully and tried in every way to follow the instructions given for teaching these lessons.

Both classes were polite but bored. Their study of the texts revealed several difficulties not inherent in the subject itself. They could not pronounce "meridian" and "parallel" and they did not know what parallel lines were. In one text, they were directed to find on a map two streets that crossed each other and on the map the streets did not cross. They struggled valiantly to understand, but when the lessons were finished and the teacher asked them to tell in which latitude they lived, Nancy replied, "I'm stuck. I don't know." When they were asked how they could use latitude and longitude, Yates said, "That's just what I've been wondering. I can't see any use in it." One out of the fifteen said, "I like to study this because I've traveled and I'd like to know where Portland, Oregon, is." Should we select for the many the subject matter that meets the needs of the exceptional child—the one in fifteen?

One of the most frequent arguments advanced in favor of teaching these subjects is that children can find directions more readily on a map if they know latitude and longitude. To the writer, it seemed that the introduction of latitude and longitude in teaching directions confused these children, and the regular teacher of the grade said that her experience with other fourth-grade children corroborated this opinion.

This brief study does not purpose to reach conclusions but to raise questions and to indicate a possible means of answering them. Should latitude and longitude be taught in the elementary grades? If so, in which elementary grade are children most interested in the subject? If not in the elementary grades, where should the subject be taught? How well are the treatments found in the texts adapted to the needs of the children? These and many other questions confront the educator—teacher or author—in getting his bearings in latitude and longitude and to answer them there must be much careful experimentation with the children themselves. In the meantime, cannot the time formerly devoted to drill—often meaningless—in latitude and longitude be used to advantage in studying the recognized social aspects of geography?

WEATHER MAPS AND FORECASTS

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AIM

The aim of this lesson is to interest the pupils in the forecasting of weather and its value; to teach them how to read weather reports intelligently; to provoke thought and to create a desire for more knowledge on the subject.

APPROACH

One of the pupils brought to Current Topics class an article on "Damage by Floods in the Mississippi Valley." This led to a discussion as to the cause and how it might have been prevented. From this we realized it would be well to know more about weather conditions and we decided to take Weather Forecasting for a special problem in our geography class.

Fortunately our school is located within two blocks of a United States Weather Bureau and we were able to get much information both from the attendant and from maps and pamphlets which he gave us.

PROCEDURE

A set of large weather maps showing the report for several consecutive days was placed across the front of the class room.

These maps were presented by the Weather Bureau. Each pupil had one of the small weather maps that are issued daily.

As a class we had previously visited the Weather Bureau and gained much information which the children were able to use as the work progressed. The pupils had their regular textbooks, reference books, government reports and pamphlets from which to gather data.

We arranged our material according to the following outline which was worked out in class.

I. Information gained from examination of weather maps

1. Atmospheric pressure shown by isobars—solid lines drawn thru points having the same atmospheric pressure

2. Influence of elevation on temperature shown by isotherms—dotted lines drawn thru places that have same temperature

3. Direction of winds indicated by an arrow that flies with the wind

4. Track of cyclonic storms

(1) Center of areas of low barometric pressure or general storm marked LOW

(2) Center of high barometric pressure marked HIGH

5. Shaded areas—where rain or snow has occurred during last twenty-four hours

II. Knowledge secured thru reference reading

1. How data contained on maps are procured. Observations taken in the United States and Canada each day at 8 A. M. and 8 P. M., using the time of seventy-fifth meridian

2. Facts contained in reports

(1) Observations of barometer and thermometer

(2) Velocity and direction of wind

(3) State of the weather and amount of rain and snow

3. Distribution of reports

(1) More than 150 weather stations

(2) Maps and bulletins

4. Preparation of maps

(1) Experts compare facts from all parts of country

(2) Plot them on a map and tell where storm areas are

III. Application and relation of knowledge gathered

1. What isobars show

(1) Normal pressure 30 inches

(2) One-tenth inch increase in barometric pressure until crest is located marked HIGH
(3) One-tenth inch decrease in barometric pressure until center of depression is located marked LOW
(4) Closer lines show greater velocity of wind

2. Meaning of isotherms
(1) LOWS—Preceded by rising temperature
(2) HIGHS—Preceded by falling temperature

3. Cyclonic storms
(1) Caused by unequal heating, and surface features that break circulation and form eddies
(2) Carried by Westerlies
(3) Low pressure areas marked by inflowing spiral winds (which blow counter clock wise), high temperature, rain or snow

4. Anti-cyclonic storms. High pressure areas distinguished by out-flowing spiral winds (which blow clock-wise), low temperature, clear skies and cold wave

5. General movement of Lows and Highs
(1) West to east from 600 to 700 miles daily
(2) Similar to atmospheric waves. "High" representing crest of wave and "Low" trough of wave

6. Importance of these storms
(1) Advantages. Bring rain, and constant changes of weather which are an aid to health and stimulus to work.
(2) Disadvantages. Cause much damage from floods, frost, and strong winds

IV. Value of weather forecasts as gathered from observation and reading

1. Warnings of approach of storms, change in temperature, rainfall and floods

2. Warnings reach people by daily bulletins, telegraph, telephone, radio and display of weather flags

3. Benefits of warnings to agriculture
(1) Harvesting before rain
(2) Protection against floods
(3) Protection against frost by heating fruit orchards in blossoming time and flooding cranberry bogs and rice fields

4. Benefits of warnings to commerce
   (1) Postponement of voyages because of approaching storms
   (2) Avoidance of danger from dense fogs
   (3) Protection from tropical hurricanes

FURTHER APPLICATION

We did not drop the subject when our outline was finished but the pupils of their own initiative wrote to the Department of Agriculture at Washington and asked that Weather Maps and bulletins be sent to us each day. They became intensely interested in the weather reports found in the daily papers, which they verified or corrected thru their own observation. A collection of maps, that showed the progress of a storm, was made.

REFERENCES

Brigham and McFarlane. Essentials of Geography Book II
Tarr and McMurry. Book II, Part II
Salisbury, Barrows and Tower. Elements of Geography
Huntington and Cushing. Principles of Human Geography
Pamphlets from United States Weather Bureau, Washington, D. C.

VARIATIONS AMONG THE STATES IN WEALTH

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The Department of Commerce has issued recently estimates of the wealth of each of the states as of December 31, 1922, and has compared these estimates with those made a decade earlier for December 31, 1912. The values vary greatly among the states, ranging from a little more than a half billion dollars in Nevada to nearly thirty-seven billion dollars in New York. The three poorest states are Nevada, Delaware and Vermont and the three richest are New York, Pennsylvania and Illinois.

As the states differ widely in area, their estimated wealth has been divided by their area and the quotients used in making Figure 1, which shows the variations among the states in the average valuation per square mile. In this respect, Nevada is again the poorest state. Only eight states are richer than Delaware, the poorest eastern state in this respect, and all of the western states, except California, together with all of the Gulf states and Maine rank below Vermont, which was the third poorest in total wealth.

The richest state in proportion to area is Rhode Island, and three other small states, Massachusetts, New Jersey and Connecticut are well ahead of New York, and Ohio is ahead of Illinois. It is thus apparent that the smaller industrial states have an advantage over the larger states in this respect. The relatively greater wealth of the northeastern quarter of the country is apparent in

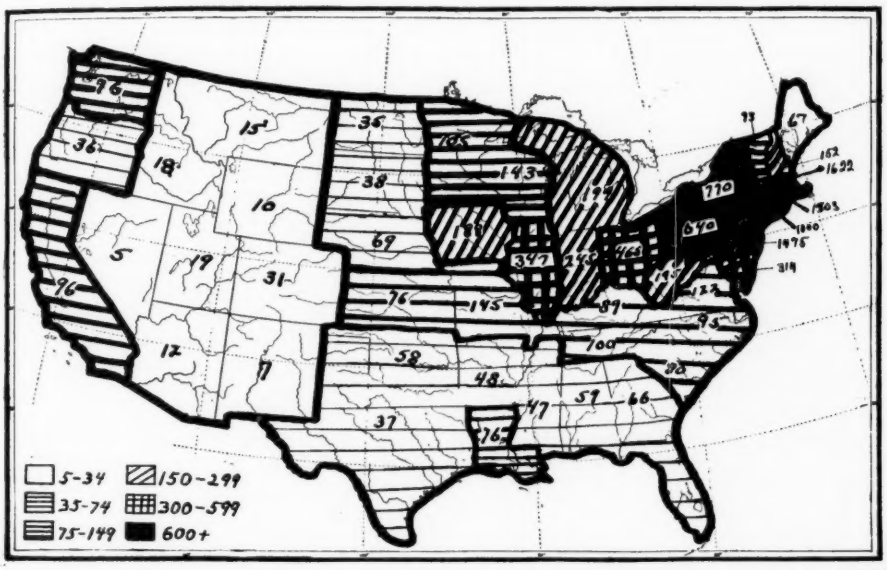

FIG. 1. Sketch map showing estimated wealth by states, on the basis of $1,000 per square mile. Census estimates for December 31, 1922

Figure 1, and several other interesting geographic variations are evident.

The Census Bureau also supplied statements as to the per capita wealth by states. Figure 2 has been prepared to show conspicuously the regional contrasts. In proportion to population, Nevada contains the most wealth, and all of the western states except New Mexico rank ahead of Rhode Island and most of them ahead of New York. Connecticut is the wealthiest eastern state in proportion to population and Illinois surpasses all other states east of the Mississippi except New York and New Jersey. The poorest states in proportion to population are in the south, east of the Mississippi River (Mississippi, Alabama, Georgia, South Carolina). These states contain most of the Negroes.

The high per capita wealth of some of the states in the west as compared with some of those in the northeast is however unreal,

for much property in the newer western states is owned by easterners. For example, the railroads of Nevada make up almost one third of all assessed property in the state; those of New Mexico, one fourth; and those of Wyoming and Montana each about one seventh. The per capita wealth of the people in any area really involves, of course, only the property that the people of that area own, and hence in many of the states, the real per capita wealth is much less than shown by Figure 2, because the railroads, mines,

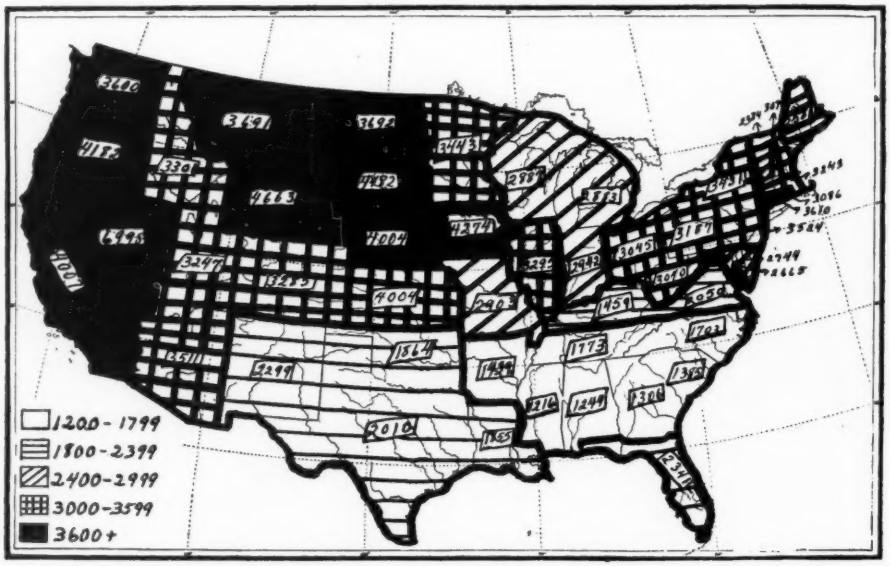

FIG. 2. Sketch map showing per capita wealth by states in dollars. Estimated by Census Bureau for December 31, 1922

and even much of the land is owned by persons living in eastern states. Among eastern states, also, there is a variation related to opportunities for investment within the state, those states with large industrial cities having a higher per capita wealth than nearby states within which the industrial development is less advanced. Laws also make a difference; for example, Indiana's antiquated general property tax and high tax rate discourages local investment and encourages investments in tax-exempt government bonds and in property or bonds in other states. The absence of a "blue sky law" until 1920 had a similar effect.

The increases in the per capita wealth for the decade ending December 31, 1922, are shown in Figure 3. This map differs conspicuously from the others, indeed only two states (South Dakota

and Wyoming) are black (especially prosperous) on this map which are also black on either of the other maps. In other words, with these two exceptions, neither the states having the highest average per capita wealth nor those with the greatest average wealth per square mile have had the greatest increases in wealth in the decade. This is partly explained by the fact that this map shows per cent of increase. But on the other hand, the states with the least per capita wealth are likewise not those which have made

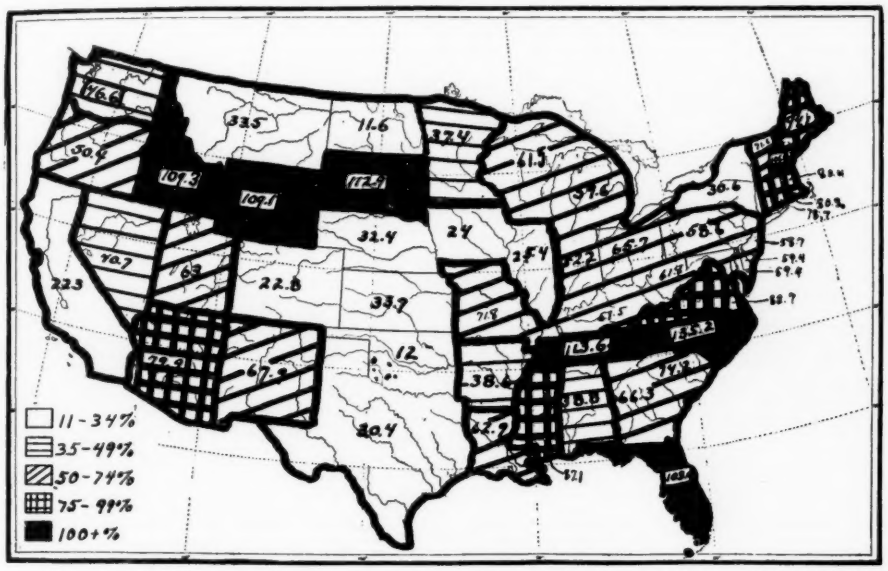

FIG. 3. Sketch map showing percentage increase in per capita wealth 1912-1922 (Census Bureau Estimates)

notable percentage gains, altho three of them (North Carolina, Tennessee and Florida) are relatively low in per capita wealth. North Carolina and Tennessee experienced notable industrial expansion in the decade under consideration, while the mineral wealth of Wyoming and Idaho has been extensively exploited, and irrigation has increased. The great gain in Florida is related to the investment of northern capital in the development of agricultural wealth and winter resorts. South Dakota's gain is largely due to higher values from farm lands, it having recently been realized that much of the land of the southeastern quarter of the state is not far inferior to the long-appreciated Iowa land.

The states showing the lowest increases in per capita wealth are North Dakota, Oklahoma and California (11.6 to 22.3 per cent).

Low prices for wheat depressed land values notably in North Dakota. Oklahoma has also suffered a relapse with the partial exhaustion of oil wells and the blasting of other rosy hopes of the early years of statehood. California, as well as the other two, has gained notably in population, which tends to reduce the per capita gain in wealth.

The total wealth of the United States on December 31, 1922 was, according to these estimates, 321 billion dollars, the per capita wealth $2,918 and the average wealth per square mile, slightly over a million dollars. There was an increase during the preceding decade of 72.2 per cent in total wealth and 49.5 per cent in per capita wealth.

MUSCLE SHOALS

A STUDY IN THE UTILIZATION OF RESOURCES

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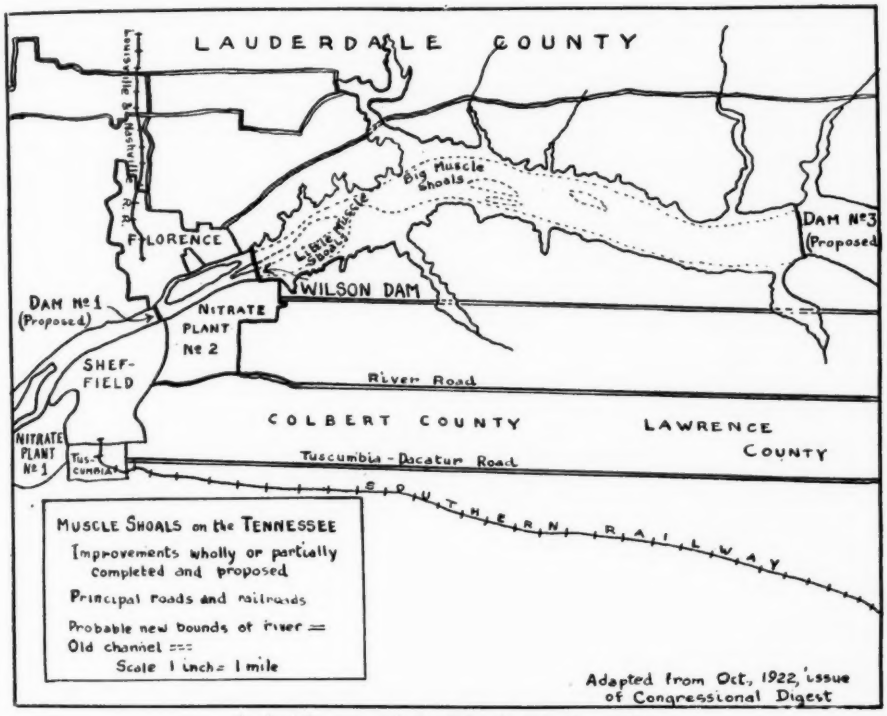
Muscle Shoals may be used with good results as a project or as a type study. It should be particularly attractive to the teacher who is seeking correlations with other school work less directly connected than is geography with the physical earth.

There is no question that the disposition of this great power plant is an issue of national concern. Because of the wide discussion in the press, it is likely that interest in Muscle Shoals will spring from members of the class—as it should. A chance article in newspaper or magazine may be brought into class, and the teacher may easily weave into the discussion which is sure to follow, lessons in geography and in the utilization of resources in general, besides helping to develop an interest in good citizenship. Available literature dealing with the subject is, however, so specialized on phases of the topic which are properly considered as merely incidental by the geography teacher, that the following material may be of value. Muscle Shoals, rich in geographic interest as it is, has not yet been presented from that point of view.

DESCRIPTION OF MUSCLE SHOALS

The immensity of man's work here near Florence and Sheffield, Alabama, is rivaled only by the natural setting; indeed the very

largeness of the undertaking hindered man until the time came when he was willing to construct works vast enough to utilize it. Between 1868 and 1913 many attempts were made to put the rapids to some use, but these attempts proved futile. Five governmental surveys during these years stimulated no real popular interest. The 37 miles of rapids had long interfered with navigation, and this during the period in our national existence when river



A sketch map of the Muscle Shoals region

transportation was extensively used. A canal around the rapids, opened in 1836, soon fell into disuse and finally into ruin; while in 1913 a second canal which had been built in 1890 was obsolete.

In this reach of 37 miles the Tennessee River drops 134 feet, and in the western seventeen miles (the section undergoing development) it drops over 100 feet. "Big" and "Little" Muscle Shoals comprise the greater part of this section.[1] The Tennessee River

[1] In popular terminology, "Muscle Shoals" is a word which includes the power site and government activities which are connected with it. The author has heard two explanations of the origin of the word "muscle": one, that muscular strength was required to ascend the river in boats; the other, seemingly more probable, that it is a misspelled form of the word "mussel."

here, tho far from its mouth (where it is larger than the Ohio into which it empties), is a stream to attract attention. The volume and breadth of the river, and the manner in which it has incised itself into the limestone, here and there protruding from the red soil, are impressive. The left bank, against which the river has swung during intrenchment, presents a sheer hundred-foot cliff of limestone.

It is well to think of the government power project, located by the shoals of the river, as (1) units completed or partially completed, and (2) units proposed but not commenced. In the former group there are: (1) United States Nitrate Plants Nos. 1 and 2, (2) the steam power plant, and (3) the Wilson Dam.

The Nitrate Plants

Since the necessity of manufacturing nitrates in this country as a war measure led to the present developments along the shoals, it is logical to think of this unit first. The two plants are separate and distinct, occupying different parts of the reservation. Each plant was designed to manufacture ammonium nitrate, each using a different process in reducing atmospheric nitrogen to a form in which it is available to plants.[2] Together they cover an area of 4,200 acres and represent a cost of $82,000,000. This does not include the cost of a steam power plant on the Warrior River, the transmission line from there to the nitrate plants, and the Waco Stone Quarry. The two manufacturing plants have a possible combined annual output of 133,000 tons of ammonium nitrate. Since a large amount of power and intense heat are required in either process, location of the works at Muscle Shoals is, in part, explained. Several buildings, each housing the machinery used in the various steps of manufacture, make up each nitrate plant. These buildings stand today well cared for, silent and lifeless, housing machinery almost as clean and new as when first put in.

The Steam Power Plant

Pending the time when the river can be effectively harnessed, heat and power must be supplied by coal.[3] This led to the con-

[2] Plant No. 1 used the Haber process, the other the Cynamid process.

[3] At first it was found necessary to enlarge the power plant of a private company at Gorgas, some 60 miles away, the power being carried over transmission lines. Difficulties arising from the merging of public and private capital here have delayed the possibilities of arriving at a satisfactory disposition of the project at Muscle Shoals.

struction, near Plant No. 2, of a steam power station, proportioned on the lines of the other physical equipment. The huge dynamos are now a source of power and light for many a southern community.

WILSON DAM

One of the most ambitious tasks ever undertaken was the building of the Wilson Dam which has been flung across the Tennessee. In order to impound the water and thus increase the amount of power, this concrete structure, 4,500 feet long and 100 feet high, was planned, and will cost when completed $45,000,000. The dam consists of three parts. On the extreme right bank is the lock which provides for navigation. Next is the spillway dam which occupies three-quarters of the structure, and finally, on the remaining thousand feet, is the power house. Work in progress is now largely concerned with completing this latter section, the rest of the work being virtually done. It is estimated that 600,000 H. P. can be developed here, while only 100,000 H. P. will be necessary to provide for the nitrate plants were they to make full demands.

IMPROVEMENTS CONTEMPLATED

Final plans provide for an even greater undertaking than the ones thus briefly described. These are (1) the building of a small navigation dam (No. 1), 300 feet long and 50 feet high; (2) the building of Dam No. 3, above Wilson Dam and about the same length as the latter but only 40 feet high; this will provide for slack water navigation 65 miles up stream; (3) finally, attempts will be made at other points up stream to regulate the flow of the river, for fluctuations in volume now stand in the way of the production of cheap primary power.

REASONS FOR LOCATION OF GOVERNMENT PROJECT

Chief among the reasons determining the general site of the present works was the inland position, for it was feared that a coastal position might increase the dangers of attack upon the plants by enemy countries. The site in northern Alabama seemed to possess all the necessary qualifications. So outstanding were the advantages of the Muscle Shoals site that the scene of operations was shifted from Pulaski, Virginia, where a site had already been chosen.

THE PROBLEM OF CONSERVATION

In considering the disposal of the resources here brought to the use of man, it is essential to keep in mind the great cost at which the water power has been developed. Furthermore it is apparent that these developments, under the urgency of war, went far beyond the demands for hydroelectric power in the region under normal peace conditions. But an enormous sum has been expended on the project, and no one would think of allowing such a splendid achievement to go by default.

The possible benefits from the achievement are (1) the production of cheap nitrate for fertilizer,[4] (2) cheapened power by the development of super-power systems, (3) available nitrate plants in the event of war, and (4) making the Tennessee River navigable to river boats for 65 miles above Wilson Dam.

IN THE WAKE OF THE WORLD FLIERS

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While reading of the "jumps" of the "World Fliers" in the newspapers every day last summer my thoughts turned to some way in which the trip might be made the basis of work in class. In September two 7A groups would be studying many of the countries over which the flight was taking place. Would it not be a good idea, I thought, to have the pupils "see these countries from the air."

INTRODUCTION OF THE SUBJECT

At the first meeting of the classes the question was raised as to how many had read of the doings of the "Fliers". Everyone had at least heard of them and many had read the daily accounts. Someone had seen in the morning paper their location for that day. Another boy had recently been up in an airplane and told of the thrills he received while in the air. Others said they wished they had been in that boy's shoes and everyone wished they could make a trip around the world by airplane. It was suggested that while they could not make the actual trip they could follow the

[4] While ammonium nitrate has not found general favor as a substitute for the Chilean nitrate, it is thought that experimentation will dispose of objectionable attributes, and finally, use will overcome prejudice.

same route in their books. That sounded interesting and they immediately became concerned over the problem of a practical working plan.

Discussion followed and it was found that to be a flier one must know more than just how to handle a steering wheel. Someone had read of airplanes falling into "air pockets" and wanted to know what that meant. After finding that it was a certain physical condition of the atmosphere they thought an aviator should know something about the weather, not only in his immediate vicinity but over a large area. If the aviator flies over a foreign country he should know about the climate of that country.

Occasionally something happens to an engine while in flight and a forced landing is necessary. A plane must have a large flat place in which to land so surface features were next in the list of things a flier should know. In flying across country the aviator is guided to a large extent by ground objects as well as maps and compasses.[1] Therefore he must know how to read maps and how to determine his location.

At this point one lesson was devoted to a review of latitude and longitude and the pupils were shown how to read maps. Each World Flier had to remember such a number of things it was thought probable that they kept diaries. Each member of the class wanted to remember a number of things also and their diaries took the form of looseleaf notebooks containing notes and pictures. The pupils were allowed some time in class to make the notebook covers and to put designs on them. The results were of varying attractiveness and ranged from airplane designs and maps of the world to appropriate pictures taken from newspapers.

ROUTE FOLLOWED

The route taken by the Fliers was looked up and each stopping place noted. On a desk map of the world this route was laid out. It was found that not all the stopping places were on the maps in the textbooks so atlases were consulted. The Readers' Guide gave many references to magazines in which there were articles on the World Flight. It was decided that instead of trying to study in detail each place at which the Fliers stopped we would confine our attention to the different countries thru which they travelled.

[1] See, The Non-Stop Flight Across America, by Lieutenant John A. MacReady, *National Geographic Magazine*, July, 1924, p. 59

After settling these important questions we were ready to begin our flight. We started from Seattle and went over British Columbia. Very little of the surface appeared to afford a landing place for an airplane in this part of the country and it was discovered that before the ships left Seattle they had been equipped with pontoons as the topography of the country necessitated flying along the coast and landing on the water. The position of the cities along the coast and the passes back of them were noted in British Columbia.

Lost in Fog

It was in Alaska that Major Martin's machine was lost. This brought up the study of fog, the climate along the coast and interior and the topography. Here was an excellent place to show how moist air in rising condenses and forms clouds and causes rain to fall on the windward sides of mountains. The story of Martin and his mechanic showed that the population of Alaska was very sparse from the fact that the two men travelled ten days without seeing anyone. The newspaper accounts spoke of the many fishing villages along the coast thus giving us one of the major occupations of the people.

As a side issue the cooperation of the navy with the army was talked over both in the case of looking for the lost Fliers and in establishing ships along the line of flight.

Crossing the Pacific

The day came when we left the last island in the Aleutian chain and set out across the Pacific. At this point the explanation of the International Date Line was in order and we found that the planes arrived in Japan on the day preceding that which marked the flight from Alaska.

An interesting tableau was here suggested in representation of the landing in Japan. There two thousand school children greeted the Fliers by singing the Star Spangled Banner and waving American flags. In the class-room one group of boys represented the Fliers with the rest at one side of the room singing the National Anthem.

Maps and Slides

During all this time the pupils had been bringing in pictures from newspapers and magazines and these were posted on the

bulletin board. One period was given over to showing stereopticon slides of Japan. The pupils drew freehand maps, thus getting a working knowledge of the various features of the country.

The World Flight has ended but this has in no whit lessened the desire to see our own journey to a finish. We are still following the flight of the "Magellans of the Air" and while we are only as far as Japan at this writing everyone is working hard to make our own efforts worthy of the pioneers whose trail we are following.

AS OTHERS SEE US

The Twenty-Second Yearbook of the National Society for the Study of Education presents an excellent discussion of the Social Sciences and portrays the present-day method of curriculum making. The trend toward the evolution of a general course in social science is presented clearly. Those interested in geography as a social science or as a distinct school subject should study the volume with care, as it not only expresses the opinions of constructive leaders in education but incidentally, and perhaps unconsciously, reveals what these leaders think of geography.

The viewpoint, of at least one contributor, is illustrated in "A Selected and Annotated Bibliography" presented on page 305, and which, presumably, contains the best available material on the subject discussed in the Yearbook. Forty-two titles are given: twenty deal with history specifically; eight with civics; one with sociology; *one with geography;* and twelve with social sciences in general or related discussions. The one reference in geography is an old book and courtesy requires that little more be said concerning it. Perhaps it happened to be handy when the list was made and was inserted to satisfy a feeling that geography should be mentioned.

This list gives the impression that history dominates the thinking of those who are seriously studying the problem of social science instruction and that geography is slighted for that reason. This impression, however, is not entirely correct. Another good reason is the lamentable fact that geographers have not provided an abundance of good studies of geography, as a school subject, comparable to the studies provided by historians. This is the fact that geographers must face. If geography is to receive

the consideration to which it is entitled as a factor in the scheme of education, geographers must do some constructive work. They have no basis for complacently assuming that geography will always be in the school curriculum just because it has been there for so long a time. Its right to exist is challenged. Its inherent qualities must be presented logically and clearly. The intensive activity of geographers in a study of this problem in an open minded and scholarly manner is needed. The cause needs the highest ability and the best training that can be secured.

GEOGRAPHICAL PUBLICATIONS

Harlan H. Barrows and Edith Putnam Parker. **Journeys in Distant Lands.** 152 pp., maps, pictures, index. Silver, Burdett and Co., N. Y. 1924.

This first book in a series is organized in a systematic way both in content and in methods. The authors have selected material that will appeal to children. They have presented this material in a vocabulary and language that children can understand.

Each topic is treated with the wealth of details that the child needs. The child comes to appreciate each region as a place where people actually live and make sensible adjustments to their environment. Thru the details the child comes to have some general notions concerning each region. The authors have necessarily been limited to a few topics. The regions apparently have been selected because of their appeal to children and because of the geographic principles, adapted to the children, that can be revealed.

The pupils are introduced in succession to the land of the Tigris and Euphrates rivers, the land of the Nile, the Congo region, Mediterranean lands, the mountains of central Europe, the Rhine River and its delta lands, the Scandinavian Peninsula, and the polar regions. The regions studied are shown in a series of progressive simple maps. The areas that have not been studied are shaded. Each map shows all regions that have been previously studied plus the region that is being studied. Gradually the outlines of the earth are revealed. Thru glimpses of lands that are treated briefly, the world map is completed. Over two-thirds of the book is devoted to Europe, Africa, and Southwest Asia.

The dominant purpose is to present a unified impression of each region. The maps and pictures have been carefully selected because of their teaching qualities. These symbols are not studied as separate treatments of the region, but are interwoven with the language symbols.

The book does not merely describe and interpret. It raises questions for the child to answer. It challenges his ability to think. He is asked to give suitable names to pictures, to raise questions he would like to have answered, and to read topics in the book in an attempt to find answers. He studies the book with definite objectives in mind.

Numerous games and exercises on a play level are provided. These activities are very helpful in fixing important facts and in broadening the child's ideas of geography.

The following questions may be raised.

1. Should the point of departure for developing an initial concept of the earth as a whole begin with the Tigris and Euphrates region or with the home area of the child?
2. Should the elementary concepts of geography be developed thru a study of regions in Africa, Europe, and Southwest Asia, or should North and South America be given more consideration?
3. Is it desirable to enlarge the vocabulary of the child with such names as Basra, Shat-el-Arab, Sudd, keleks, koofahs, and sakieh? Should the vocabulary be built up with words which are in common use, and should the place names be selected with reference to the more important places?

The book is an exceedingly valuable contribution in the textbook field. The authors have demonstrated that a book can be written from the child's viewpoint so as to give him an understanding of principles influencing man's activities, at the same time that a love for the subject is being developed.

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Ellsworth Huntington. **The Character of Races.** 393 pp., 19 ills. Chas. Scribner's Sons, N. Y. 1924. $5.00.

Dr. Huntington has won a wide reputation by his thought-stimulating books. His textbooks have been unusually successful and his books on climate and its influences have aroused interest among thinkers the world over. In "Civilization and Climate" and "World Power and Evolution" and elsewhere he has concluded that climatic influences are perhaps the most important aspects of man's environment and that a favorable climate is almost essential to a high civilization. Altho this theory is widely supported, there are some exceptions. For example the people of North China are less progressive, on the average, than those of tropical South China, and the civilization of Iceland is distinctly higher than its unattractive climate would lead one to expect.

In "The Character of Races," Dr. Huntington discusses several of these exceptions and concludes that they are explained by the results of selective migrations. Iceland was largely settled by a superior class, which for a thousand years has remained almost undiluted. Because of its racial superiority, it has maintained a rather high civilization under great difficulties and has yielded a remarkably large number of eminent men. North China, on the other hand, is backward because the frequent famines there have induced the more alert people to leave the region. Nearly a third of the book is given to discussing China and Iceland and establishing these significant interpretations.

Another interesting section of this illuminating book deals with the influence of the repeated glaciations of much of Europe. Dr. Huntington believes that the repeated selective siftings by the radical changes in the environment, caused by the successive growth and decline of the ice sheets, were very significant in advancing civilization. His discussion of the probable effects of the glacial and interglacial conditions upon the people of Egypt, Mesopotamia and eastern Asia is scientifically noteworthy.

The last 75 pages deals with America and some of our most pressing problems. The dangers associated with immigration, the movement to cities, feminism, and the present character of the birth-rate are discussed in a worth-while manner.

University of Indiana S. S. VISHER

Evans Lewin. **Africa.** 223 pp., 19 maps and diagrams, 29 photographs. The Clarendon Press, Oxford, England. 1924. $1.00.

This small volume gives one a very good picture of the geography of Africa. The continent is not treated from a regional standpoint, but such topics as position and extent, political divisions, surface features, islands, climate, people, means of communication, seaports and towns, and the economic development are discussed. Every page is filled with information. One reads that the grerater part of Africa is not suitable for permanent settlement by Europeans on account of climate. However, there are a few areas adapted for Europeans, such as the cooler regions of northern and southern Africa and some of the highlands. The reader draws the conclusion that for a long time Africa will remain a source for raw materials and manufacturing will not be so important.

Chicago Normal College FREDERICK K. BRANOM

Carol Della Chiesa. **The Three of Salu.** Subtitle, Around the World in Northern Italy. 179 pages, profusely illustrated. World Book Company, Yonkers-on-Hudson, New York.

The author of this little book is an Italian, and gives us a true picture of the life of an Italian family of the upper class. Tho the book is not strictly geographical, it contains a great deal of information of a geographical nature. Many of the sketches with which it is illustrated are charming. The amount of detail and length of the sentences limit, to some extent, the usefulness of the book in the class room. It seems best adapted for use as reference matter or for reading at home. The free use of Italian words would, no doubt, be disconcerting to many teachers with no knowledge of the pronunciation of Italian.

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Katherine Elizabeth Dopp. **Bobby and Betty with the Workers.** 199 pages, illustrated with pictures in color. Rand McNally & Company, New York.

A new Dopp reader is always received with interest by the grade teacher. This one, "Bobby and Betty with the Workers", is very attractive inside and out. The appeal to children—it has a strong appeal—is not only in the colored pictures, but in the use that is made of nursery rhymes and riddles. The stories about the different workers are in the natural conversational style of the everyday activity of the home. It is not a geography reader, but the part it could play in the hands of a thoughtful teacher in training the children to observe, think and question, would be an important step in preparing for the geography lessons to follow.

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